



Nebraska Public Power District

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10 CFR 50.73

NLS2020065
December 28, 2020

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Licensee Event Report No. 2020-003-00
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2020-003-00.

There are no regulatory commitments contained in this request.

Sincerely,

John Dent, Jr.
Vice President and
Chief Nuclear Officer

/jo

Attachment: Licensee Event Report 2020-003-00

cc: Regional Administrator w/attachment
USNRC - Region IV

NPG Distribution w/attachment

Cooper Project Manager w/attachment
USNRC - NRR Plant Licensing Branch IV

INPO Records Center w/attachment
via IRIS entry


Senior Resident Inspector w/attachment
USNRC - CNS

SORC Chairman w/attachment

SRAB Administrator w/attachment

CNS Records w/attachment

AE22
NRR

NRC FORM 366 (08-2020)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 08/31/2023			
 LICENSEE EVENT REPORT (LER) (See Page 3 for required number of digits/characters for each block) (See NUREG-1022, R 3 for instruction and guidance for completing this form https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)					Estimated burden per response to comply with this mandatory collection request 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollcts.Resource@nrc.gov , and the OMB reviewer at OMB.Office.of.Information.and.Regulatory.Affairs,(3150-0104),Attn:Desk:ail_omr_submission@omb.eop.gov . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.					
1. Facility Name Cooper Nuclear Station					2. Docket Number 05000298		3. Page 1 OF 3			
4. Title Manual Reactor Scram due to Digital Electro-Hydraulic Fluid Leak										
5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
11	01	2020	2020	- 003 -	00	12	28	2020		05000
									Facility Name	Docket Number
										05000
9. Operating Mode					10. Power Level					
1					100					
11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)										
10 CFR Part 20		<input type="checkbox"/> 20.2203(a)(2)(vi)		<input type="checkbox"/> 50.36(c)(2)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)		
<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		10 CFR Part 73		
<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.69(g)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(4)		
<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.71(a)(5)		
<input type="checkbox"/> 20.2203(a)(2)(i)		10 CFR Part 21		<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(1)(i)		
<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 21.2(c)		<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(i)		
<input type="checkbox"/> 20.2203(a)(2)(iii)		10 CFR Part 50		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)		<input type="checkbox"/> 73.77(a)(2)(ii)		
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)				
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)				
<input type="checkbox"/> Other (Specify here, in Abstract, or in NRC 366A).										
12. Licensee Contact for this LER										
Licensee Contact Linda Dewhurst, Regulatory Affairs and Compliance Manager								Phone Number (Include Area Code) (402) 825-5416		
13. Complete One Line for each Component Failure Described in this Report										
Cause	System	Component	Manufacturer	Reportable To IRIS	Cause	System	Component	Manufacturer	Reportable To IRIS	
B	TG	PCV	S157	Y						
14. Supplemental Report Expected						15. Expected Submission Date			Month	Day
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If yes, complete 15 Expected Submission Date)										
16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)										
<p>On November 1, 2020, at 0534, Cooper Nuclear Station (CNS) Control Room Operators inserted a manual reactor scram due to low Digital Electro-Hydraulic (DEH) tank level. Further investigation revealed that a leak had developed at governor valve (GV) 1, and a pencil-sized stream of EH fluid was discovered leaking out of the lower, outboard inspection port on the GV1 actuator.</p> <p>Investigation revealed one bolt on the actuator inspection port cover plate was bottomed-out and prevented appropriate tightening for an adequate seal. The o-ring on this cover plate was ruptured, allowing excessive leakage.</p> <p>The causes were on-site vendor craftsmanship was unsatisfactory in the failure to recognize the bottomed-out bolt during actuator installation and inspection port cover plate holes on the new GV1 actuator body were not threaded deep enough to meet vendor specifications. CNS will appropriately classify critical Turbine Generator Fluid connections that are subject to additional verification of bolting and torquing performance. In addition, CNS will review the final vendor evaluation of the actuator manufacturing defects/field craftsmanship and determine if additional actions are warranted.</p> <p>This event was not risk significant.</p>										

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk at aira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Cooper Nuclear Station	05000-298	2020	- 003	- 00

NARRATIVE**PLANT STATUS**

Cooper Nuclear Station (CNS) was in Mode 1, Power Operation, at 100 percent power at the time of the event on November 1, 2020.

BACKGROUND

The power conversion systems at CNS are designed to produce electrical energy through conversion of a portion of thermal energy contained in the saturated steam supplied from the reactor, condense the turbine exhaust steam into water, and return the water to the reactor as heated feedwater. The saturated steam produced by the reactor is passed through the high pressure turbine [EIS:TRB] where the steam is expanded and then exhausted through the moisture separators [EIS:MSR]. The moisture separators reduce the moisture content of the steam to close to zero percent. The steam is then passed through the low pressure turbines where the steam is again expanded. From the low pressure turbines, the steam is exhausted into the condenser [EIS:COND] where the steam is condensed and de-aerated and then returned to the cycle as condensate.

The main turbine [EIS:TA] consists of a high pressure section and a low pressure section comprised of two turbines in tandem. Steam from the reactor is admitted to the high pressure turbine section through two main stop valve and governor valve assemblies [EIS:PCV]. After expansion through the high pressure turbine section, steam flows to four moisture separators and returns to the low pressure turbine section by passing through four sets of combined intermediate valves (intercept valves and reheat stop valves combined into one assembly) [EIS:ISV]. These intermediate valves, fully open during normal operation, limit or isolate steam flow from the moisture separators to the low pressure turbines under certain conditions. This action will prevent potential damage to the low pressure turbines.

The turbine utilizes a Digital Electro-Hydraulic (DEH) [EIS:TG] system to control reactor pressure by positioning governor valves and condenser bypass valves. It consists of solid state governor devices, governor, startup control devices, emergency devices for turbine and plant protection (overspeed governor, master trip, vacuum trip, motoring protection, thrust bearing wear trip, low bearing oil pressure trip) and special control and test devices. The control system operates the main stop valves, governor valves, bypass valves, reheat stop and intercept valves and other protective devices. DEH system oil pressure is maintained by two hydraulic pumps [EIS:P] located at the DEH reservoir tank [EIS:T].

EVENT DESCRIPTION

During Refueling Outage 30 (Fall 2018) three governor valve actuators were replaced with refurbished actuators. Upon testing, a fourth governor valve actuator had to be emergently replaced due to a leak. The preventative maintenance frequency was changed from every 6 years to every 2 years to replace the four governor valve actuators every cycle. Three spare governor valve actuators had previously been installed at CNS and were refurbished for use in Refueling Outage 31 (Fall 2020). A fourth governor valve actuator had to be purchased.

While staging the governor valve actuators for replacement of the existing installed actuators, it was noticed that the purchased actuator was missing inspection port cover plates. Per vendor recommendation, a decision was made to relocate covers from one of the actuators being removed to the new actuator prior to installation.

In-field work to relocate the inspection port cover plates commenced by the vendor and the four actuators were installed. The DEH system was successfully post-work tested and in service for approximately two weeks. Three days after CNS reached 100% power, an oil leak was discovered on the number one governor valve actuator inspection port cover plate.

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Cooper Nuclear Station	05000-298	2020	- 003	- 00

On November 1, 2020, the Control Room received an alarm for abnormal turbine DEH fluid reservoir level, resulting in a rapid power reduction per station procedure and subsequent manual reactor scram.

Investigation of the number one governor valve actuator inspection port cover plate revealed that one bolt was bottomed-out and prevented appropriate tightening for an adequate seal, and the o-ring was ruptured, resulting in the oil leak. A visual gap between the bolt head and the lock washer was apparent indicating the bolt was bottomed-out. This configuration was not noticed during installation. Measurements taken confirm that this bolt could not have physically been installed correctly because the holes in the actuator body were not threaded deep enough to accept the length of specified bolt. Two other bolts on the leaking cover were discovered to be loose enough to move with an Allen wrench.

To correct the condition, the bolts were cut short enough to achieve adequate tightening while maintaining necessary thread engagement in the existing holes.

On November 4, 2020, at 1153, CNS reached 100 percent power.

BASIS FOR REPORT

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in actuation of systems listed in paragraph (a)(2)(iv)(B); specifically, (a)(2)(iv)(B)(1) for a reactor protection system actuation resulting in a reactor scram and (a)(2)(iv)(B)(2) for a Group 2 isolation occurring due to reactor vessel level reaching the isolation setpoint. The event was reported as Event Notification Number 54976.

SAFETY SIGNIFICANCE

This event has negligible safety significance. The manual reactor scram removed the main turbine from service. Insufficient DEH system pressure prevented operation of the main turbine bypass valves.

CAUSE

The direct cause of this event was at least one bolt on number one governor valve actuator inspection port cover plate was bottomed-out. This was due to on-site vendor craftsmanship being unsatisfactory in the failure to recognize bottomed-out bolt upon actuator installation. In addition, the inspection port cover plate holes on the new number one governor valve actuator body were not threaded deep enough to meet vendor specifications.

CORRECTIVE ACTIONS

CNS will appropriately classify critical Turbine Generator Fluid connections that are subject to additional verification of bolting and torqueing performance. In addition, CNS will review the final vendor evaluation of the actuator manufacturing defects/field craftsmanship and determine if additional actions are warranted.

PREVIOUS EVENTS

On November 11, 2009, CNS control room operators inserted a manual reactor scram after a non-isolable DEH fluid leak developed. This was reported under LER 2009-004-00, Manual Reactor Scram for DEH Fluid Leak.

On November 6, 2009, CNS control room operators inserted a manual reactor scram when vessel water level lowered quickly after a turbine trip. This was reported under LER 2009-002-00, Manual Scram on Low Water Level Caused by Turbine Trip from Hydraulic Fluid Leak.